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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE PCT NATIONAL STAGE APPLICATION OF  
ELEANOR BERNICE RIDLEY ET AL

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FOR: COPOLYMERS AND THEIR USE IN  
PERSONAL CARE COMPOSITIONS

U.S. APPLICATION NO: 10/523,242

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.132

I, Bernice Ridley, a citizen of Great Britain and presently residing at 32 Pitchstone Court, Leeds, West Yorkshire hereby declare:

That I was awarded the degree of BSc Hons in Chemistry by Manchester University, in 1987;

That I have been employed by Ciba Specialty Chemicals (formerly CIBA-GEIGY AG), Switzerland, which has recently been bought by BASF of Germany, as a chemist since 1990, and presently hold the position of Senior Scientist;

That I have been working in the field of personal care polymer development for over 20 years;

That I am an inventor on U.S. Patent Application Serial No. 10/523,242;

That I have read and am familiar with the contents of WO 02/40622, US6,361,768, US6,365,656 and US 5,665,368:

That the experiments described in the following have been made by me or under my supervision and the evaluation of the results has been done by myself.

## EXPERIMENTS

Microfluorescence studies were carried out on undamaged medium brown European hair tresses treated with a simple cream conditioner to characterize the deposition of the conditioning polymers.

Polymer 1 (prior art) and Polymer 2 (according to the invention) were added to a rinse off conditioner formulation for microfluorescence studies on the root, middle and tip.

Polymer 1 is acrylamide/ethyltrimonium chloride methacrylate (20:80) dispersed in propylene glycol dicaprylate/dicaprate, activated with PPG-1 Trideceth-6.

Polymer 2 (according to the invention) is dimethylacrylamide/ethyltrimonium chloride methacrylate (20:80) dispersed in propylene glycol dicaprylate dicaprate and activated with PPG-1 Trideceth-6 and C10-C11 Isoparaffin.

The Rinse-off conditioner formulation for microfluorescence studies:

	INCI Name	%
Part A	Aqua	85.15
Part B	Oleth-5	2.50
	Panthenol	0.25
	Glycerin	5.00
	Tetrasodium EDTA	0.05
	Chamomila Extract	0.25
	Propylene Glycol and Diazoldenyl Urea and Iodoprpynyl butyl carbamate	0.50
	Polymer 1 or Polymer 2	1.50

Tagging Hair Fibers with Sulforhodamine B

The hair tress was shampooed prior to treatment with conditioner. The tress was shampooed under running tap water. A quantity of shampoo was weighted out and applied to the hair tress from the root-to-tip. The hair tress was rinsed for 30 seconds and dried overnight.

Three sets of 30 fiber segments (15 were treated with conditioner and 15 served as controls) from 3 different locations: root, middle and tip.

Each hair fiber was mounted on glass slides with double stick and numbered so the location of the treated hair fibers and controls came from the same hair fibers. The hair fibers were immersed in the respective conditioners for 45 minutes, and then rinsed by immersing the glass slides containing the hair fibers in a 1 liter beaker of warm tap water in back and forth motion for 30 seconds. After air drying, the treated and untreated hair fibers were post labeled using Sulforhodamine B for 30 seconds followed by rinsing with water. The fibers were then air dried and stored in the dark prior to analysis by microfluorometry.

The microfluorometry was preformed on a a Leitz MPV 1.1 with a Vertical Ploem Illuminator. The results were then compared.

## Results

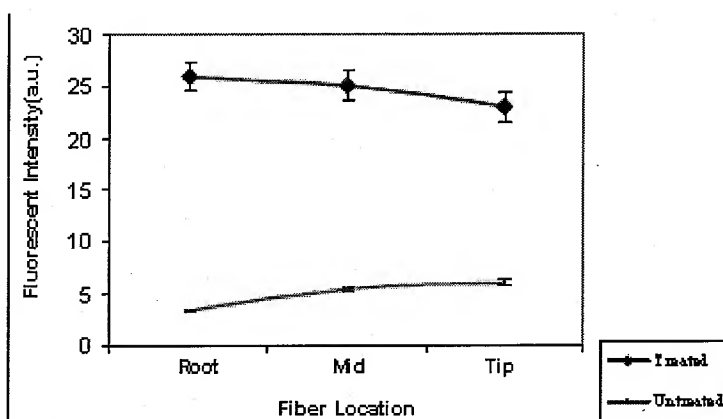
Fluorescent Intensities of root, middle and tip sections of hair fibers treated with Polymer 1.

Figure 1

Fiber #	Root				Middle				Tip			
	Untreated		Treated		Untreated		Treated		Untreated		Treated	
	Int	SD	Int	SD	Int	SD	Int	SD	Int	SD	Int	SD
1	2.47	0.23	10.56	1.11	8.02	0.69	7.17	1.06	16.04	1.6	7.99	1.11
2	7.52	0.42	35.6	4.91	2.54	0.22	31.64	3.59	4.53	0.58	38.85	4.36
3	5.32	0.44	28.95	14.2	2.92	0.46	12.88	1.16	6.62	2.22	16.34	1.37
4	1.31	0.34	41.53	8.43	2.87	0.57	42.42	14.7	6.38	0.6	35.83	16.55
5	2.96	0.29	43.95	7.14	4.46	1.31	28.5	7.73	8.92	1.5	24.32	8.69
6	4.91	0.36	15.49	2.42	5.03	1.02	14.59	3.31	5.93	1.32	14.67	4.78
7	1.49	0.71	15.4	1.58	7.71	1.03	15.84	3.31	4.84	0.55	17.94	5.28
8	2.16	0.33	27.12	3.01	3.71	0.44	27.19	6.65	1.6	0.45	34.93	5.5
9	7.85	1.14	42.17	4.28	5.36	0.77	36.88	6.42	4.9	2.52	38.85	6.77
10	1.46	0.23	13.81	1.48	12.28	1.28	15.16	1.25	5.71	0.38	16.71	4.64
11	2.45	0.35	9.95	2.36	8.02	1.64	14.37	4.4	8.36	0.35	10.01	2.59
12	5.09	1.28	7.91	1.7	9.26	0.4	14.13	2.75	5.64	0.27	10.03	2.84
13	2.85	0.26	60.34	15.01	2.07	0.24	60.01	18.33	1.71	0.44	55.47	12.18
14	2.59	0.36	17.42	5.57	1.72	0.34	25.91	6.89	2.83	0.69	13.09	2.7
15	2.02	0.25	19.43	4.04	4.76	0.6	8.41	1.73	5.36	0.67	9.41	1.52
Avg.	3.37	0.47	25.98	5.15	5.38	0.73	25.01	5.55	5.97	0.94	22.97	5.41

Figure 1a

Average Fluorescent Intensities of hair fibers treated with Polymer 1 conditioner and untreated controls. The error bars show the standard error.



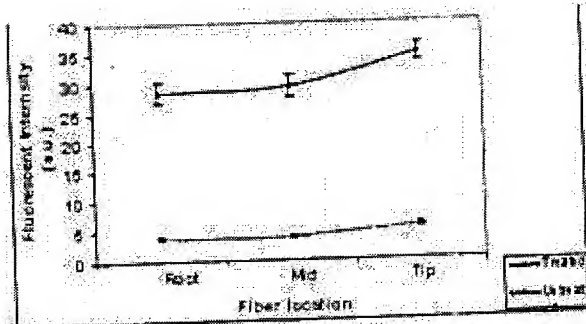
Fluorescent Intensities of root, middle and tip sections of hair fibers treated with Polymer 2 (according to the invention).

Figure 2

Fiber #	Root				Middle				Tip			
	Untreated		Treated		Untreated		Treated		Untreated		Treated	
	Int	SD	Int	SD	Int	SD	Int	SD	Int	SD	Int	SD
1	4.19	0.56	39.43	11.6	9.66	1.26	34.32	13.76	9.03	0.87	43.02	9.27
2	9.75	1.58	20.17	4.71	6.08	0.84	26.47	4.37	83	0.78	29.13	4.41
3	5.61	1.56	56.29	12.41	3.69	0.94	60.32	14.43	21.65	7.02	62	15.64
4	2.74	0.87	8.71	2.2	1.65	0.54	17.1	4.01	4.76	2.12	29.77	6.59
5	3.36	0.65	23.54	6.73	1.32	0.29	29.7	6.28	3.14	0.54	30.88	5.25
6	1.76	0.23	9.94	2.38	1.45	0.24	21.52	5.97	1.29	0.26	18.39	3.05
7	2.43	0.34	25.1	3.38	3.11	0.37	26.39	9.5	4.6	0.45	13.65	2.68
8	3.21	0.5	31.31	7.17	3.25	0.43	38.86	7.38	2.85	0.28	20.54	3.14
9	2.64	0.77	26.06	9.79	3.03	0.49	29.48	6.96	2.6	0.54	22.16	3.07
10	2.12	0.49	9.77	1.6	1.27	0.31	21.56	7.66	2.65	0.56	27.74	5.64
11	3.14	0.36	39.08	8.09	5.48	1.14	39.76	5.44	4.98	0.86	64.77	3.45
12	2.56	0.54	11.46	1.55	1.64	0.27	8.68	1.43	2.66	0.29	19.07	4.38
13	2.38	0.34	24.54	6.9	2.56	0.39	19.1	5.07	2.2	0.3	35.42	6.57
14	5.42	0.3	24.59	3.33	7.74	0.49	36.74	4.35	10.42	0.79	51.6	5.43
15	5.36	0.47	56.62	12.98	5.61	1.09	29.76	8.14	2.76	0.74	54.3	6.11
Avg.	3.78	0.64	28.44	6.35	3.84	0.61	29.32	7.00	5.59	1.09	34.83	5.65

Figure 2a

Average Fluorescent Intensities of hair fibers treated with Polymer 2 conditioner and untreated controls. The error bars show the standard error.



### CONCLUSIONS

The Polymer 2 according to the invention shows an increase in deposition of the cationic polymer from the root, where there will be relatively little damage through the tip of the hair, where the hair is most damaged. A higher level of condition is desired to effect temporary repair to the most damaged tip. It is clear from the data above that the Polymer 2 according to the invention deposits more effectively on the hair tip. This "focused conditioning" is an important advantage.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 5th day of July, 2010

*Bernice Ridley*  
Bernice Ridley